THE UNIVERSITY OF WASHINGTON

Arboretum bulletin

WINTER 1960

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Arboretum bulletin

A JOURNAL OF GENERAL HORTICULTURAL INFORMATION
PUBLISHED QUARTERLY BY THE UNIVERSITY OF WASHINGTON
ARBORETUM FOUNDATION • SEATTLE 5, WASHINGTON

No part of this BULLETIN may be reprinted without the authority of the Arboretum Foundation.

VOLUME XXIII, NUMBER 4

Winter, 1960

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COVER—The Kobe Lantern in the Japanese Garden
PHOTO BY: WILLIAM ENG

The Arboretum Bulletin

VOL. XXIII No. 4 SEATTLE, WASH. WINTER, 1960

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A Letter from the President

TO MEMBERS OF THE
ARBORETUM FOUNDATION

Greetings!

The year 1960 will long be remembered as the time of dedication of the Japanese Tea Garden, a gift of many friends of the Arboretum, including the city of Tokyo, and later a visit to the Garden by Crown Prince Akihito and his lovely Princess Michiko. At the time of their visit, two trees were planted as a living memorial to our distinguished visitors.

Since the opening of the Garden, many thousands of Washington and out-of-state visitors have been attracted by its beauty, and it is rapidly becoming one of the show places of Seattle. At the moment, it is one of the largest Japanese Gardens outside of Japan. The plantings are not yet quite completed, but the Foundation is hopeful they will be this coming year, including an evergreen hedge outside the fence, facing the Boulevard.

In this issue is the list of Committees of the Foundation.* We have endeavored to assign every Board member, particularly those who have shown special interest in our activities. In addition the membership of the Foundation has been drawn upon. It is difficult to get members who live away from Seattle to accept committee assignments, but we are hopeful that progress will be made in this matter during the year.

We have an interesting program ahead of us. May we hope that much can be accomplished and that every member will be glad to be a part of this fine civic organization.

Yours very truly,

WILLIAM D. SHANNON
President

*See Page 140 for Committee list.

Some Arboreta and Gardens of N.W. Europe in 1960

B. O. Mulligan

With the willing cooperation and material aid of the College of Forestry of the University of Washington (Dean Gordon D. Marckworth), the Arboretum Board and the Arboretum Foundation, through the then President, Mr. Edward B. Dunn, I was enabled to spend almost twelve weeks visiting all kinds of horticultural institutions as well as public and private gardens from Chicago, in mid-July, through eastern Canada to northwest Europe, and back again to the eastern United States early in October. A summary of the most notable places follows.

Having travelled to Chicago by air on Sunday, July 17th, I spent all the next day at the Morton Arboretum, one of the leading institutions of its kind in North America, especially in the field of public education in the uses and values of a large collection of woody plants. The evident success of their program is confirmed by the great number of visitors as well as by those taking part in classes through the year. The Director, Mr. C. E. Godshalk, the Curator of Collections, Mr. E. L. Kammerer, and propagator, Mr. Roy M. Nordine, in turn showed me various aspects of their buildings, activities and plantings, especially the extensive developments during the past few years since my last visit.

From Chicago I continued by air to Rochester, N.Y., where I spent 24 hours in the company of Bernard Harkness, taxonomist with the City Parks Department, past president of the American Association of Botanic Gardens and Arboretums, and exceedingly well informed on the woody plants cultivated in that area.

Here it was most illuminating and of great interest to see native trees of many Chinese and Japanese species introduced by Professor C. S. Sargent from Japan some fifty years ago, or by E. H. Wilson from China a decade later. The collections of trees are most extensive and unusual in their variety of species; a complete catalogue would be of great value to other arboreta as well as to nurserymen. Conifers are particularly well represented in the 500-acre Durand-Eastman park, magnolias have grown into large specimens and many rare individual trees are to be found; for example Japanese beech, hornbeam and linden, *Abies recurvata* and *Acer griseum* from W. China, and the fastigiate form of the N. American tulip tree. Altogether a remarkable arboretum for that region.

From Rochester I drove with Mr. Harkness and Mr. Fred Lape, of Esperance, N.Y., through Niagara to Hamilton, Ontario, where on the 21st we enjoyed a visit to the Royal Botanical Garden, meeting the propagator, Ray Halward, in the absence of the Director, Mr. Leslie Laking. An extensive collection of Hemerocallis was in bloom at the time and children were busy in one corner working in their individual gardens. We also saw the rock garden, arboretum, and one of the native trails of this large 1900-acre establishment, which is supported principally by the city with annual grants from the Province of Ontario.

Crossing Ontario eastward next day we noted groups of native balsam fir, white spruce, white pine, eastern arbor-vitae, and *Juniperus communis* var. *depressa* growing near the highway. All perhaps of greater interest to me than the other members of the party, who were more familiar with them in the wild state.

We reached Ottawa on the afternoon of the 22nd and after finding a convenient motel went at once to the Dominion Arboretum, near the western approach to the city, forming part of the vast Dominion Experimental Farm. The curator is Mr. A. R. Buckley.

Plantings here are arranged by families and genera; the oldest trees date back to about 1890, so there are many mature speci-

mens to be seen, of conifers, elms, maples, oaks and other trees, and of very large Euonymus in particular amongst the shrubs. A comprehensive assemblage of forms of *Potentilla fruticosa* was noted in the nursery and plants of eight of these were received at Seattle, September 30th.

On Sunday the 24th we drove 185 miles into Montreal and spent a couple of hours in the famous Botanical Garden later that afternoon, amidst a crowd of citizens strolling along the paths enjoying the massed beds of perennial phlox, petunias and other annual flowers in full bloom, as well as the magnificent series of conservatories through which we were conducted next morning by the curator, Mr. Henry Teuscher, designer and master-mind behind all that appears here.

The site is quite flat, and is subdivided into numerous sections serving different purposes, —gardens for perennials, water plants, rock plants, of vegetables, of medicinal plants, for children and so on. Under glass whole houses are devoted to begonias, to ferns both temperate and sub-tropical, to economic plants, cacti and succulent plants from different regions, etc. The massive rock garden and arboretum largely remain to be developed. Including the educational services provided it forms a most valuable asset to the city which has financed and supported its development from the beginning, and its principal architect as well as the citizens may well feel proud of this great garden.

On the evening of the 25th I left my companions and departed by air at 6:20 p.m. for Scotland, where we duly arrived some 8½ hours later at Prestwick after a comfortable flight. A bus brought us into Glasgow in 1½ hours, from which a train took about the same time to reach my first European goal, Edinburgh, the capital city and a mecca for plant lovers the world over.

Here I stayed for only three brief days, in the hospitable care of Dr. H. R. Fletcher, Regius Keeper of the Royal Botanic Garden, through whom I was also enabled to visit the garden around Benmore, a property of the Forestry Commission near Dunoon in Argyllshire, of which the Botanic Garden has charge. The high rainfall (about 90 ins. annually) produces superb trees, for example, Douglas, noble, and European white firs, and astonishing plants of the large-leaved rhododendrons of the *Grande* and *Falconeri* series. A number of Chilean plants such as *Tricuspidaria, Fitzroya,* and the climbing *Berberidopsis* also flourish under such conditions. A plant of *Rhododendron campanulatum* is 30 feet in height, of unknown age and provenance.

The Botanic Garden is certainly full of fine plants, from trees to the smallest alpine types, nearly all in happy condition despite the difficulties of healthy growth in a smoky city. Members of the family *Ericaceae* are of course most prominent and of much interest to us in the Northwest, but the variety of material to be found in the Garden is wide enough to satisfy almost all tastes. The conservatories also contain many attractive plants of all sizes and kinds, not hardy enough to be grown outdoors.

A new greenhouse and propagating house shown to me by the curator, Mr. E. E. Kemp, were of considerable interest, as was the Herbarium, where I took time to examine specimens of Asiatic maples, with the aid of Mr. Peter Green.

Reluctantly I departed from Edinburgh by train for Perth on the afternoon of July 29th, but was happy to be met at the latter station by our old friend Mr. E. H. M. Cox, twice a visitor and lecturer in Seattle in recent years, author of "Modern Rhododendrons" (1956), "Plant Hunting in China" (1945), and other earlier works. The week end was spent at his home, Glendoick, where are to be seen some exceptional 40 years old trees and shrubs of Chinese origin—the evergreen *Berberis Coxii, Betula albo-sinensis* var. *septentrionalis* with its beautiful smooth orange-brown trunk, and many rhododendron species; an elegant small maple with striped bark also took my eye, which was to be seen again in other gardens in Great Britain; it was probably *Acer Forrestii* from W. China, almost unknown in

(Continued on Page 140)

Japanese Shrubs in the Arboretum
(of the Order Rosales)

PAT BALLARD*

THE coming of the Japanese Garden to our Arboretum has brought, once again, an emphasis on Japanese plant material. In previous issues of the Bulletin, we have recorded *Japanese Trees in Our Arboretum* (Fall, 1956), and members of the Heath family among the *Japanese Shrubs in Our Arboretum* (Fall, 1957).

An ever-increasing number of American gardens are echoing the fundamentals of Japanese design, particularly here in the west where the climate and geographical situation offer Nipponese shrubs a familiar environment. The uncluttered simplicity and austere beauty of Japanese garden design, with that quality described by David Engel and Richard Neutra *(Japanese Gardens Today)* as "humanized naturalism," bring a sense of quiet and repose to even a city garden. In the Arboretum you will find many species and varieties, other than those planted in the Japanese garden itself.

There are still too many genera, native to Japan and growing in our Arboretum, to cover in one issue, so we will resort to a botanical gambit. Since studying plant material in related groups seems to make more sense, and since the *Rosaceae* and allied families have much to offer any garden, we have chosen the Order *Rosales* for this report. The reasons for lumping these genera in one botanical unit are not relevant, at the moment, but this group of plants is a horticultural treasure trove, with beauty of flower, fruit, and form.

The shrubby members of the Saxifrage family *(Saxifragaceae)* are sometimes a bit difficult to distinguish from some of those in the Rose family, and even the botanists have at times been puzzled as to just which belongs where.

Japan has given us several species of *Deutzia*. *D. scabra* (Utsugi) is represented in the Arboretum in several varieties. It is a deciduous shrub that may reach 10 feet in height. The slender-pointed leaves may be as long as 4 inches and almost 2 inches wide. The white, or sometimes tinged-pink, flowers are held in 3- to 6-inch panicles at the ends of short lateral twigs. There are double-flowered and rose-colored forms of this attractive, hardy shrub. *D. gracilis* does not grow as tall, nor are its panicles as long. W. J. Bean says it is not as hardy as *D. scabra* but Rehder places it in Zone IV. *D. crenata* is cited by Rehder as a synonym for *D. scabra*.

The genus *Hydrangea* has several Japanese members flourishing in the Arboretum. *H. anomala* var. *petiolaris* is one of the climbing members of the genus and you will find it clambering up the trunks of Douglas firs near the Camellia section. Our finest example is growing on the south wall of the stone cottage, where it is overlooked by many visitors. Wilson says this species is a rampant grower in the damp forests of Japan, and sometimes reaches a length of 70 or 80 feet. It is similar to *Schizophragma hydrangeoides* but differs in its longer leaf-stems and in the form of the flower.* The climbing hydrangea is probably more hardy than the schizophragma.

H. macrophylla (Azisai) is found in the Arboretum in a number of forms; *H. hortensis* is a synonym for this "common hydrangea." *H. paniculata* (Peegee hydrangea), though usually a shrub, may take the form of a tree and stretch to as much as 25 or 30 feet. It is perhaps the hardiest of the species and, according to the R.H.S. *Dictionary of Gardening*, responds to severe pruning in late winter by producing pyramidal panicles as long as 18 inches. Such drastic treatment could shorten the life of the plants. This

*Our ever-faithful Mrs. (Page) Ballard, certainly one of the most enthusiastic and devoted members of the Editorial Board.

*The sterile flowers of *Hydrangea* possess 3 or 4 enlarged sepals, of *Schizophragma*, only one.

species is in the Arboretum nursery. *H. serrata* is planted around the Franklin tree in the Camellia section. It is a much smaller shrub than the preceding and is far more hardy; (Rehder says, Zone IV or V). Bean describes it as "small, neat, . . . dainty."

Ribes fasciculatum produces its fragrant yellow flowers in fascicles, holds its leaves later than most, and its brilliantly scarlet fruits remain on the branches throughout the winter, according to Rehder.

The Witch-Hazel family is next in the botanical scheme of things and Japan is well-endowed with members of the *Hamamelidaceae. Disanthus cercidifolius,* in the Hamamelis section, is a deciduous shrub with an ultimate height of 8 or 10 feet. Its inconspicuous flowers show its family relationship, but its charm lies in the vivid fall coloring of its leathery leaves. As this is being written, the orange-tinted red leaves are falling and the tiny wine-colored blossoms are studding the branches.

Distylium racemosum is one of the few evergreen genera in this group. In the Hamamelis section you can see several of these interesting shrubs. It is unlikely that it would ever attain here either the height or the tree-like habit that is its custom in its native home.

Most of us are familiar with the early-blooming *Corylopsis spicata* (Tosa-mizuki) and *C. pauciflora* (Hyuga-mizuki). They seldom reach more than 6 feet and are handsome ornamental shrubs. Growing near them is *C. glabrescens*. Its flowers are smaller, but its greater height and its occasional tree-like form make it unique. It also has the distinction of being the hardiest member of the genus.

The Japanese Witch-Hazels, with other members of the family, may be seen in the Winter Garden as well as in the Hamamelis section, across the road from the Hollies. *H. japonica* (Mansaku) and its several forms fit into a woodland environment and make themselves very much at home with our native shrubs and trees.

Pittosporum Tobira (Tobera) is of questionable hardiness in some of our colder areas, but its handsome evergreen foliage and creamy, orange-scented flowers make it worth any effort. These are growing in a protected area near the foreman's house.

The Rose family has many genera in Japan and in the Arboretum. *Spiraea betulaefolia,* in Woodland Garden, was grown from Japanese seed and planted out in 1955. *S. Thunbergii* (Yuki-yanagi) is a taller shrub and its white flowers are larger. It is to be found in the nursery area. *Sorbus gracilis* grows in the mountain forests of Kyushu and Hondo. Its bronzy-green new foliage, rich autumn coloring, slow-growing habit, white flowers and red fruits make it an excellent garden subject.

Photinia glabra (Kanamemochi) was introduced by E. H. Wilson in 1914. It has lacquer-colored new foliage and glossy evergreen leaves. *P. villosa* is a deciduous shrub or small tree, and holds its fruit long after the autumn-tinted leaves have fallen. *Eriobotrya japonica* is closely related to the photinias, but differs in its larger 3- or 5-celled fruit. The Loquat may take the form of a small tree, with some variation in the size of its persistent leaves. It reverses the normal plant behavior by putting forth fragrant, creamy flowers in September-October and producing its edible, yellow fruit in May-June. It was planted in the bed north of the office in 1956.

Raphiolepis umbellata (Sharinbai) comes from southern Japan, but is probably more hardy than other members of this genus. This attractive shrub is grown for its handsome evergreen leaves, as well as for its fragrant white flowers. It may be seen on the bank opposite the head of Rhododendron Glen. *Malus Sargentii,* in the Crabapple section, is low-branching and is now as tall, if not taller, than most authorities say its ultimate height should be. Its red fruits are about the size of those of the mountain ash.

The familiar Japanese quince is present in the Arboretum in variety. *Chaenomeles japonica* (Shudome) is, generally speaking, lower

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Strictly Personal

ELSE M. FRYE*

WHEN I handed my fern paper** to Mr. Mulligan I told him it was my swan song; I was not having new experiences so had nothing to write about, but suddenly I am having more adventure—we moved. For two years before this every week end—yes, every one—my husband stood in the garden considering what needed doing—labor to him, not creation as it is to me, and said, "You had better find a smaller place." I began to hunt and finally I could say to a very astonished man. "I have found one." It was small; it was charming; had a spectacular view, looking down upon Lake Washington, across a marsh, over the valley and beyond to the Cascades—all under a high sky, blue and white. Well, I did not get this place; the road is difficult in winter, the property too sloping for easy gardening, my husband did not like it, my daughter did not favor it. And last, but not least, the owners did not wish to part with it.

Time went on; the search continued. I used to watch and wish as I saw a small house go up, sprawling over the ground. It is not really at all like but it reminded me of the Arizona and New Mexico adobes where people live more out of doors than in. I liked the Arizona sandstone that was used, the ample windows and the redwood. After much talk and argument we moved.

We have no view; no sea and no mountains. We have beautiful sunrises and moonrises, the morning star and the evening star. And also a soft blue dome overhead, a never-ending beneficence. All this we have by ignoring numerous wires—not always easy. However, in the spring the wires have their part; they are the resting place of flocks of cedar waxwings, juncoes, robins, and thrushes too. And above, coming and going, are gulls, ducks and an occasional blue heron.

A friend wrote me wondering what sort of garden I had inherited; I was extremely grateful that the garden was all to be made. It is a sunny, open half-acre which in itself presents a difficult challenge as my last garden was a shady place adapted to most of the plants I know. To begin with, we have a huge Douglas fir which is a boon. Directly under it I put my small shade-loving things —shortias, schizocodon, the small and dainty *Trillium rivale, Cypripedium, Erythronium,* Mr. English's small maidenhair fern, still unnamed, *Epigaea asiatica, Rubus parvus,* some gaultherias and more of that ilk.

There were two stiff and erect spruces, the branches stiff and horizontal, gray green, by the gate. I do not know their name but I wonder they are not more often used—they definitely have an architectural value. And then along the driveway on one side is a huge, beautiful blue spruce. Now to my mind the blue spruces, mixed with the grays and greens on their native Colorado slopes are spectacular, with definite rhythm and music in the colors, but a single specimen to be made part of a small garden presents difficulties especially since I am not adept with gray-foliaged plants, but I am working at it. Near-by was a small tormented and ill-nourished blue spruce. It seemed to have no interest in growing nor even surviving. It bothered me. I often considered pulling it out. But last summer it began to show growth. So that these two would not look so lonely in my green garden I acquired another small blue specimen spruce. In time, say twenty-five years(!), these trees will make an accenting triangle with other blue-gray plants.

On the other side of the driveway is a comparatively small madrona—we love it. It is also making good growth. A *Prunus Pissardii* had been left very much to its own devices; it has been pruned into better lines. And near the gate a white hawthorn had gone

*Contributions by Mrs. Frye are always welcome to the pages of our *Bulletin*. At the author's request the article is dedicated to the memory of Mrs. Loren Grinstead, Sr.

**See *Arboretum Bulletin* XIX—Nos. 2 and 3—Summer and Fall 1956.

wild; beautiful in bloom, but it produces a constant show of wild shoots and every fruit germinates. In its vicinity we now have a small group of *Pinus contorta*. When they have made adequate growth the hawthorn will be eliminated.

This ground was originally an old orchard and there remained four pie cherries and four damson plums, beautiful in their seasons of flower and fruit but a pest with their suckers and seedlings. Quite incompatible with my other plants, they were removed.

The lawn extended in a wide sweep from the house to the rail fence. It was summer; the sun shone down on us; we were very much in view of the passerby. We began the shrubby border immediately. I laid down hoses to mark the line inch by inch till the sweep pleased me. A Filipino gardener skinned the sod off. He was splendid and understood what I wanted but when he brought three relatives to help the work lagged. But at last it was done and the sod made what I called my $150.00 compost pile! It has since been put to good use.

This took us just beyond the fir tree; part of the object of this move was to give me less garden activity. But my husband admitted this was not the place to stop and I was permitted to continue it to the service gate, the natural stopping place. One has to work with space; it is as exciting as the lines of a house.

In the evening we walked out to survey what had been accomplished; my husband shook his head and ventured that I could never get it into condition! Along came an old school friend. He looked very dubious and pointed his finger at a horrible weed of which there were many. Well! One can't scream at some one else's husband. My own did not fare so well!

Later we swept the border, inch by inch again, back along the driveway, ending in a broadened rounded curve, ample and beautiful. A slender purple beech and a pink dogwood are the important plants at this end. Between them and the blue spruce is a beautiful *Hamamelis mollis*.

My daughter and son-in-law gave up their spring and summer to help me and my plants to get moved and also sharing some of their own treasure with me. My son-in-law is the most wonderful planter—every root is considered. But—he does not like to move a big shrub several times. I did not feel too downhearted about this because not even Mr. Holmdahl himself can always tell the exact spot. Later, I had a high school boy to help me. He thought it was very amusing after planting a Kalmia to find that I wanted it moved eight inches the next day and fifteen the next. Of course each inch added to his pay check.

Another thing my daughter and son-in-law have done for me is to bring in pieces of log. Some were fitted together for size. These are the greatest pleasure to me and make the best background for the smaller plants, and cast a little shade also. In no time at all they cover themselves with moss and stray seedlings have started to grow there. My young people never go on any small excursion but what rare and unusual things are brought back.

The first plants to be moved were two *Pinus Thunbergii* that I had pinched and cut and weighted. They were planted together to make it seem one plant, against the buttress of the Arizona sandstone chimney. That is very beautiful, absolutely satisfying.

In the shrubby border we planted such treasures as we were able to take with us; Metasequoia, Euonymus species; *Rhus Cotinus,* the purple form; *Parrotia persica,* rhododendrons and groundcovers in variety. When Mr. Ester came along he suggested something yellow and something blue in this sea of rosy color. The pale yellow was easily managed with a tall azalea but the blue—well, it just happened. Many years ago in Victoria I had bought a small forget-me-not, round and compact in habit. Its progeny have not retained these characteristics but their flowers made a wonderful blue carpet just when and where they were needed.

Another group that gives me special joy is the Corylopsis. I have a large *C. spicata* behind a pink rhododendron. The young purple

leaves and creamy flowers with the rosy bloom of the rhododendron is enchanting. And behind, tall and straight, is the blue-green *Macleaya (Bocconia) cordata*, plume poppy, an old-fashioned plant. It reminds me not only of the giver but of a piece of road on the way to Acapulco. We came upon a little forest of it.

My husband in the meantime was sifting the soil in the beds along the house. We kept the planting in front of the windows low. And here I made a grave mistake; it was much too sunny and hot for the plants I liked to use. I now have *Euonymus radicans coloratus* and *Stranvaesia undulata* with *Cyclamen neapolitanum* and various small gaultherias. In this garden, of all the small gaultherias, I have come to depend most on *Gaultheria procumbens*.

Along the breezeway and garage at the back the planting is high against the walls and low in front. And here are two spectacular pieces of driftwood, bold and sparse in line, with here and there a bit of chartreuse lichen. These came from a fallen giant *Pinus ponderosa* from the high Okanogan hills where my granddaughter and her husband have a ranch. When I pass, it takes me back to that sunny fragrant day when we found it. Here also is a group of shining Oregon grape and a large pink-flowered *Viburnum fragrans*. A small *Pinus edulis,* one of my treasures, and *Pieris japonica,* with clumps of *Iris* 'Golden Nymph' and other oddments finishes the planting.

The soil sifting proved too arduous for my husband and now for the first time I pick up rocks like everyone else—so much so that we have had dug two large pits to contain them.

Between the garage and kitchen there is a small patio where we have our summer suppers and finish up the evening with the paper and knitting. In the bed I see from the kitchen window I thought it would be interesting to have an herb garden. This planting had neither character nor interest for me and I gave it up. The wall is now completely covered by a beautiful *Clematis Armandii*. Coming up to meet it is a white-flowered Camellia, an experiment because our climate is not warm enough; also *Ternstroemia gymnanthera (japonica)* and *Choisya ternata*. Among them are some beautiful hybrid *Helleborus orientalis, Gaultheria procumbens* and *Cyclamen neapolitanum,* all nice to look at.

The other bed which is not so much in our eyes contains Enkianthus, *Viburnum fragrans,* the little pink 'Cameo' rose, and for winter interest the ground is covered with a small white-leaved ivy, always pretty.

The west boundary was limited by some large white pines, *Pinus monticola,* diseased with blister rust as so many of them are. Nevertheless, they made a handsome sky-line and background. Logs were brought into this area; some woodsy, deciduous things were planted,—the native Indian plum, *Viburnum fragrans,* vine maple and the like. And there we planted our ferns—many kinds.

In the meantime my daughter, granddaughter and I had been in Vancouver on a visit to Mr. E. Wiper whose great interest is ferns from the spore stage onward. He was rather intrigued by this three-generation excursion, all interested in and bent on the same thing. He was very kind to us and we came home with much treasure for the fern planting.

On November 3, 1958 we had a dreadful windstorm—a hurricane really. The fir tree branches were swept in almost the opposite direction from which they grew. It was fantastic and frightening. In the night one of the white pines was twisted off at the base, dropped with a dull thud, filling the back yard, just missing the garage. We were advised to cut the others, too large for topping. What a scar it left; sadness too.

We had to begin all over. The trees were cut at different heights so we retained the stump-interest as part of our background. My son-in-law and daughter, again to the rescue, brought in some tormented and abused *Pinus contorta,* white birch, small whips of Japanese vine maple and many small wildlings. By the end of summer it was a very poetic planting.

We also have a patio off the living room,

enclosed in a grape-stake fence, a southwest exposure which is too hot to be a comfort to us. But it necessitated some thought. We moved a huge *Rhododendron ponticum* five feet to where we could always see the lovely green from the kitchen counter. Yes, I can *hear* my readers smile at the idea of a *ponticum* rhododendron in my garden! But when living in a rigorous climate one accepts gratefully the things that will grow well. Other plants along the fence are enkianthus, azalea, quince hybrids, *Jasminum nudiflorum* and one *Azara microphylla*. I love it and hope it can stand it. The ground was covered with primroses and *Helleborus orientalis* hybrids. The outside of the fence was hung with several clematis and crowded with lilacs, beautiful in bloom but very sad in summer. I had neither strength nor time to care for them properly so they were taken to the Arboretum to the memorial planting for Mrs. Oliver Ester. They were replaced by a motley collection of *Pinus mugo* with a foreground planting of azaleas chosen specially for the beautiful fall color of the leaves. The flowers are in shades of yellow, pale to dark and rich.

The front part of the garden is separated from the back by a fence and a group of fishpole bamboo. It is really beautiful there and functional. We do have to watch it; it travels.

I have since acquired three other bamboos and begun to study Mr. John Grant's remarks about this group; he thinks we could use them to good advantage much more than we do. Because of his advice on this subject I lifted the black stemmed bamboo, *Phyllostachys niger,* and put it against the fence at the end of the driveway. Then we had a hard freeze and I suffered; but so far it is in good condition, beautiful and poetic looking. The rest of the fence is covered by a *Clematis Armandii* and the ground encrusted with *Sasifraga primuloides.*

The other bamboos are *Pleioblastus pumilus,* one- to two-foot mass of bright green throughout the year. Mr. Grant calls it "colorless" but I like it. But do not plant it near the house—it will walk right in. *Sasa Veitchii* grows at a prodigious rate. It is eighteen inches to two feet in height. I have not yet learned how to use it to best advantage. By fall the leaves are edged with bright yellow which fades to buff by winter—really lovely coloration.

By hard work and much "agitating" the other side of the driveway has been prepared and partially planted. It is going to be nice, but still raw. I have wondered about this characteristic "agitating." Is it acquired or inherited? I think the latter; maybe it comes from my wandering parents who crossed two oceans and a continent and back again to find a home in Washington. This quality is looked upon in diverse ways by my family; my two granddaughters are amused by it. My husband and daughter are frankly wearied. Often the question comes up; —can't it wait till spring; can't it wait till fall; does it have to be done now? The answer is always, "Yes." There is a regular tempo in developing any craft that is compelling. After all, my time grows short.

My husband thinks the back yard is the worst looking one he ever saw. Maybe, but give me time and that "agitating" will see me through.

Throughout all this effort a most wonderful and almost unbelievable thing happened. Many friends, former customers and nursery people, brought me gift plants—many of them—from their own gardens to help in this new venture. I look out of the windows and feel the friendship there; it will warm me all my days. And I have been completely shameless in asking advice. Sometimes it has been taken and other times it serves to clarify a problem.

I have been reading a book rather thoroughly.* I shall introduce you to the author, Mr. Graham Stuart Thomas. His likeness is on the inside of the back cover. His lips are curved to smiling and his eyes smile also. It is a young face but I imagine those eyes have

(Continued on Page 143)

*"Colour in the Winter Garden" (Phoenix House Ltd., London, 1957)

Light and Flowering

Robert K. Campbell*

THE little cave girl ran from the dark of the cave into the morning sunlight. A nearby gooseberry shrub had kindled into fiery blossom overnight. She was enchanted. "Mama! The bush has flowers," she yelled back into the cave. "The red bush has flowers again—just like last year, mama—Why?" The woman probably answered, "The gods did it," or "Nature did it," and the girl was satisfied. Through the ages, people have asked the same question. Until recently, they have been given and have been contented with the same answers. Homer's Greeks were satisfied, and even created Persephone to insure the annual phenomenon of flowering. Perhaps, to the orderly mind of a Greek, only the caprice of a goddess could explain why some plants flower in spring, others in summer or autumn, and some even in winter.

Today, the plant physiologist, a particular breed of botanist whose special interest is why and how plants function, can sympathize with his perplexed ancestors. Each passing year of investigation into plant functions emphasizes the complex nature of the flowering process.

The physiologist now knows that before flowering a plant must have a reasonable balance of mineral nutrients and carbohydrates. After this balance is obtained, light and temperature are the main environmental factors which control flowering.

In nature, light, as a controlling factor, is extremely complex in itself. Light intensity, i.e., the amount of energy received from sunlight, may vary greatly from hour to hour because of cloudiness. Also, ordinary white daylight is composed of many colors of light, and the relative proportion of the different colors making up daylight is not immutable. For example, evening and morning sunlight has a higher percentage of red in it than does noon sunlight. Different light colors, or quality of light, may have dissimilar effects on processes in the plant. Finally, days are much longer in the summer than in the winter; plants may respond to differences in duration of light.

In 1686, John Ray made the first recorded observations on diversity in plants due to light variation. But no direct influence of light on flowering was reported until 1920 when Garner and Allard's very important discoveries were published. For fourteen years, these botanists had been working with Maryland mammoth tobacco. This strain of tobacco grew very vigorously, but in Maryland it flowered only in the winter. Garner and Allard tried many experiments, using various light intensities and temperature conditions, to induce the tobacco plants to flower in the summer. Finally, during long summer days, they gave the plants only a few hours of daylight. Plants so treated produced buds and flowered almost immediately. Given long days in the winter, they would not flower. Soybeans and several other species behaved similarly.

Since that time hundreds of species of plants have been tested for their response to different day lengths. These species can be classified into four groups: (1) *Short-day plants*—flowering obtained only when the day length is less than a certain number of hours, usually twelve; (2) *Long-day plants*—flowering occurs only when the day length exceeds a certain number of hours, usually sixteen; (3) *Day length neutral plants*—flowering occurs regardless of day length. *Begonia semperflorens* and the orchid, *Cypripedium,* are good examples; (4) *Intermediate plants*—flowering occurs only when day length is not too short or too long. *Mikania scandens* and *Phaseolus polystachys* flower only when the day length is between 12 and 16 hours.

This fairly complex system of control by

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duration of daylight is further complicated in that some plants are obligate short day, long day or intermediate plants; others are not. Poinsettia and *Salvia occidentalis* must be grown in a day length less than 12 hours before they will flower, while stock *(Matthiola incana)* must have light for more than 14 hours each day to flower. China aster *(Callistephus chinensis)* is really a short day plant. It will produce buds almost immediately after being subjected to short days. But, in contrast to plants like poinsettia and *S. occidentalis,* it will eventually flower even if continuously grown in 16 hour days. Under this condition, flowers do not form until the plants are large and vigorous. Consequently, this plant does best when planted in the long days of summer so that it flowers in late autumn. Conversely, flowers appear on petunia much earlier with long day treatment than in short days.

Recently another complication in this scheme has been discovered. Some plants—French geranium *(Pelargonium grandiflorum)* and *Campanula Medium* for example—require alternate periods of long and short days to flower. Flower buds are initiated by short day conditions, but the buds do not open unless long day conditions ensue. These are examples of short day/long day plants; long day/short day plants have also been found.

Plant physiologists have not restricted their investigations concerning the effect of light on flowering to the study of day length. They have discovered, with the greenhouseman and gardener, that poinsettia and many other short day plants will not flower if a street lamp is nearby. They now understand that low-intensity light flashed on a plant during the night will destroy all the benefits of a short day treatment to short day plants. They also know that for some obligate short day plants, such as *Salvia occidentalis,* flowers may be induced by long day treatment using very low intensity light.

The recent discovery that light color influences flowering may bring about even more startling revelations than has Garner and Allard's discovery of the importance of day length. All colors that are mixed to form white light do not have an equal effect on flowering. Apparently the two most active colors of light, pertaining to flowering, are red and infra-red. A short flash of red light, during the long night required by short day plants, will prevent short day plants from flowering. If the flash of red light is followed immediately by a similar burst of infra-red light, the plants will flower. No matter how many times this cycle is repeated, if the infra-red light is applied last, flowering will result.

Every new discovery about flowering appears to multiply the complexity of the problem. In 1949, an elaborately constructed, controlled-environment greenhouse was built at the California Institute of Technology in Pasadena. It was designed for study of the interrelation of light and temperature and their combined influence on plant growth and flowering. Hundreds of experiments have been completed in this greenhouse. These experiments show that most of the effects of light on flowering that we have just examined can be modified drastically by altering day and night temperatures.

Has the plant physiologist only substituted the words "light" and "temperature" for "gods" and "nature" in answer to the question, "Why do plants flower?" No! For man can control light and temperature; gods and nature are beyond his reach. In 1930, ten years after the discovery that day length influenced flowering, Alex Laurie, author of *Commercial Flower Forcing,* first applied reduced day lengths to flower growing en masse. Commercial growers now reduce day lengths by shading, or lengthen days by using artificial lights, to give us flowers at any season of the year.

Now an even more basic relation between light color and flowering has been discovered. What benefits will this discovery have to gardeners and greenhousemen—or even to those who only purchase an occasional bouquet, corsage or wreath?

The Arboretum and the Fifth World Forestry Congress

J. A. Witt

THE last week of August and the first week of September 1960, may well have been among the most memorable fortnights in the University of Washington's history, for then the Fifth World Forestry Congress met on the Campus. About 2,000 delegates from 65 countries gathered to discuss the many problems of forestry the world around, with a central theme of multiple use of forests and forest lands.

The Arboretum's part in this conclave was small, but by no means insignificant, and in one function, the planting of the International Friendship Grove, played a major role.

A program for planting a tree representing each nation attending the congress was envisioned early in the planning stages and a committee was formed to expedite this. At that time the Arboretum was chosen to serve as the collection point for the trees, and to supervise the planting. Ideally, each country should have sent a tree to represent itself in the grove, but due to quarantine regulations this was impractical, and the committee decided to choose domestically grown trees representative of the various participating nations. Again the Arboretum with its wealth of tree species was able to supply specimens from most temperate climates, sometimes with a tree raised from seed collected in the country it was to represent.

By early August, most of the trees had been dug from our nursery and were stored in the lath-house where a temporary misting system was rigged to keep the newly moved trees from suffering in the unusually warm and dry weather. The Arboretum's plants were joined by a group from Oregon State College, Wind River Arboretum, Carson, Wash., the Col. W. B. Greeley Forest Nursery, and several private nurseries, in large part native tree species to represent those tropical countries whose flora could survive here only under greenhouse conditions.

While this was going on the committee was busily matching country to tree and making some necessary changes where it was found that certain trees were not available or did not survive the untimely moving.

There were also changes in the delegations attending the Congress, some coming originally not planned for, others dropping out at the last minute. In fact, it was not until several days after the opening of the Congress that the final tree to country assignments were made.

The planting site, on Campus Parkway in front of Lander and Terry Halls, was then marked according to the landscape plan drawn by Lawrence Halprin and Associates. This envisioned the trees forming a series of connecting groves, with winding paths among them, the hardier species protecting those less hardy.

The trees were all set into their permanent locations by Friday, Sept. 2, each with a neat mound of soil for the delegate chosen to do the planting to shovel into the hole, and on Saturday, September 3rd, the ceremony took place with considerable pomp; bands playing, flags flying, and many delegates in colorful native garb. In all, sixty-five trees representing sixty-five countries were planted, thirty-nine of which came from the Arboretum, and one, the cork oak, from the Drug Plant Gardens of the College of Pharmacy. The trees in the Grove will be labelled with their common and scientific names and the country which they represent, and will, it is hoped, stand as a living reminder of the Congress and, incidentally, of the part played in it by the Arboretum.

In addition to this most important function, the Arboretum participated in several other activities. The plenary sessions at Meany Hall were opened by a very effective pageant entitled, "A Salute to the Forests of the World," performed against a background of living

plants furnished jointly by the Campus greenhouse and the Arboretum.

An open house for the delegates and their wives was held on August 30th, and brought over a number of interested and interesting foresters from many nations. They were entertained in the Japanese Garden and served tea and cookies in the clubhouse by members of the Arboretum Foundation. So many delegates wanted to be conducted around that daily tours were scheduled and a number of foresters, both foreign and from the United States, were taken through the Arboretum. Others visited us without benefit of a guide and there were unusually large numbers of visitors despite the damp weather that continued throughout most of the Congress.

It was a hectic but thoroughly enjoyable time for all concerned and one not likely to be forgotten as long as the trees in the International Friendship Grove are growing.

Below is a list of the trees furnished to this planting by the Arboretum:

FORSYTHIAS

One of the most brilliant of the Forsythias growing in the Arboretum came to us from the Arnold Arboretum in 1952 under the name of *Forsythia* 'Beatrix Farrand.' Three plants have been set out, two on the west side of Azalea Way in the Forsythia collection and one in the bed immediately south of the club house. All three have flowered freely with large golden yellow blooms and have set copious seed. The large seed set gave rise to some doubts as to the authenticity of the name since *F.* 'Beatrix Farrand' was supposed to be very nearly sterile. In the October issue of "Arnoldia"* we now find that our plants were actually from a sister seedling of 'Beatrix Farrand' which has received the name of *Forsythia* 'Karl Sax,' honoring that famous cytologist and former director of the Arnold Arboretum.

We assume that the two seedlings were somehow mixed and the wrong plants shipped to us eight years ago.

J. A. W.

**Arnoldia, 20,* (8), pp. 49-50, (Oct. 1960)

Trees Donated to the International Friendship Grove

September 3, 1960

COUNTRY	COMMON NAME	SCIENTIFIC NAME
Argentina	Roble	*Nothofagus obliqua*
Australia	Gum-top stringybark	*Eucalyptus gigantea*
Brazil	Johnston's gum	*Eucalyptus Johnstonii*
Bulgaria	Tartarian maple	*Acer tataricum*
Burma	Oriental arborvitae	*Thuja orientalis*
Canada	Sugar maple	*Acer saccharum*
Chile	Coigue	*Nothofagus Dombeyi*
China	China fir	*Cunninghamia lanceolata*
Gabon	Chestnut oak	*Quercus Prinus*
Greece	European hop-hornbeam	*Ostrya carpinifolia*
Poland	Polish larch	*Larix polonica*
Rumania	Macedonian pine	*Pinus Peuce*
Spain	Cork oak*	*Quercus suber**
Sudan	Port Orford cedar	*Chamaecyparis Lawsoniana*
Switzerland	Golden-chain tree	*Laburnum alpinum*
Tunisia	Algerian fir	*Abies numidica*
Turkey	Turkey oak	*Quercus Cerris*
Union of South Africa	Western larch	*Larix occidentalis*
Union of Soviet Socialist Republics	Siberian larch	*Larix sibirica*
United Kingdom	English oak	*Quercus robur*
Venezuela	Eastern hemlock	*Tsuga canadensis*
Viet-Nam	Saghalin spruce	*Picea Glehnii*
Yugoslavia	Serbian spruce	*Picea Omorika*

*From Drug Plant Gardens, College of Pharmacy, University of Washington

Our Japanese Garden

INTRODUCTION

Mr. Iida, landscape architect for our Japanese garden, most kindly agreed before leaving Seattle in June, 1960, to write a description of the garden for our Arboretum Bulletin.

This will not only give a mental picture of it but also show the reason for each part of the area, and the type of plant material used in it.

We hope also that the photographs included in this issue will adequately depict the scope and magnitude of the change wrought here in a few months by a great artist and his very competent assistants.

BRIEF HISTORY OF JAPANESE GARDENS AND THE UNIVERSITY OF WASHINGTON ARBORETUM GARDEN

Juki Iida and Associates

THE ART OF JAPANESE GARDENS is so old that it is really hard to trace its origin. It is generally believed that along with the introduction of Buddhism, ideas of gardening were brought from the Asiatic continent. At first they were crude and consisted of little more than a pond with an island after the Chinese style.

The first gardens that remain are those of the Heian period (781-1185) when a type of architecture called the Shinden Zukuri was popular. This called for various buildings arranged with spacious lakes, large enough to float boats, with islets, and so constructed for the sole enjoyment of the owners.

Later, following the Kamakura period (1186-1313) with the introduction of the Zen sect of Buddhism, Japanese landscaping came into being. The Zen gardens were more substantial and more reposeful and were based not on surface effects but upon good rules of landscaping. The size of the individual gardens became smaller and more attention was being paid to plant materials. It became more "shibui." At this time the introduction of "dry garden" type of landscape became popular. (The use of trees, rocks and pebbles to show mountains, waterfalls, and water.) Also brush painting in black and white using "sumi" flourished. During this period the introduction of mountain, waterfall, rockeries, use of trees and shrubs reached its finest. The garden was so planned that the visitor was able to view it from all angles. This is known as the "Sansui" garden.

During the Muromachi period (1335-1573) landscaping further developed the use of small space to form a picture garden.

The Momoyama period (1573-1603), ushering in a time of great magnificence, displayed the growing unity and power of the ruling classes by constructing gay and heavily ornamental gardens. Among the more famous gardens is the Katsura Detached Palace grounds in Kyoto. Many of the famous and more popular gardens of Japan found in Kyoto were constructed during this period. The University of Washington Arboretum's Japanese tea garden reflects the style found during this period.

The Edo Period (1603-1868) saw an entirely new type of garden. Although many new gardens were constructed very few were outstanding. The gardens were generally smaller and of little note.

With the introduction of world trade during the Meiji Period (1868-1912) Japan was eager to grasp the fine points of other nations. Flower beds, lawn, gravel paths, bronze statues, and other such ornaments of the west were taken over.

Although the original introduction of gardens came from the outside world, the ideas and technique of the Japanese gardens developed a new type under the climatic conditions of Japan. The Japanese garden has a distinctive feature of its own. It introduces the use of hills, forested areas, waterfalls and lakes. The future trend in Japanese gardening depends to a great degree upon how much the Japanese will incorporate the western design. Many examples of Japanese landscaping can still be found in old Kyoto and will become the heritage of the entire world, sources from which the West can receive instruction in the more leisurely art of living as practiced in the Orient.

The general rules of Japanese landscaping, to be followed in the design and construction of all types of gardens, while not of great importance to the creative designer, do review the historic development of the Japanese garden and allow the Westerner to obtain a fairly good idea of what the gardens are supposed to represent. The fundamental plan of a Japanese garden incorporates the hill and pond, the flat courtyard, the ceremonial tea garden and the popular "restaurant" type of gardens.

The University of Washington Arboretum's Japanese tea garden is one in which the Japanese native arts are incorporated for the pleasure of the American public. The garden is planned to be viewed from all sides, the ceremonial tea house being one of the main points of interest.

The dense secluded mountain forest covered with conifers on the southern portion of the garden represents the higher ground. From this forested area emerge two streams, one being natural and the other man-made, which seem to be flowing from the background hills over a waterfall, down a rockery to a point where the two meet near the mountain villa to form a lake.

From the neighborhood of the mountain villa the forest passes to the tableland and the view changes accordingly; thus the stream, after over-leaping the dam, presents a wide water level, forming the lake. Along the lake shore there are the cliffs rising, the

cape projecting, the pebble beach and the sand beach; the building for the moon viewing appears on the western shore, behind that being the flowering garden of plum trees and cherry trees. In the northern portion of the lake the rock bed is protruding and forms islands, and bridges are spanned from an island to either shore of the lake. This portion of the lake which has islands presents a marsh view in the plain, the shore becoming low, the sandy beach and the reedy strand being seen, facing the village shore (the site for the clubhouse) to the north and forming the harbor at the mouth of the river. At one side of the harbor the wisteria trellis is set for the pleasure seekers of the village.

The outlet of the lake forms a mountain torrent through the rock bed area of the northeastern shore and runs into the sea (the exterior of the garden).

Having in the center the water view which starts from the mountain as the stream and then forms the lake, paths are made throughout the garden to give various scenes for a round trip.

The entrances of the garden:

The main entrance is situated at the northern point along the Boulevard and accommodated with the roofed garden gate. The visitors enter on foot through this gate. The entrance for trucks to carry materials is provided at the southern end of the garden. This road passes to the west side of the mountain villa through the mountain area.

The enclosure and the way of opening the garden:

Around the garden, the pruned evergreen hedge about five feet high is to be provided. At the center of this hedge, the wire fence is set in.

The opening of the garden is generally allowed on fine days, and if necessary, at night or on rainy days.

The allotment and height of the grounds:

The allotment and height of the grounds in the garden are to be put in practice according to the annexed plans, putting as much weight as possible on the existing natural features. The piling of earth at the mountain area is to be done without giving damage to the existing trees, and only in unavoidable cases are the trees to be transplanted.

The stream and the waterfall:

The upper streams above the dam built in the natural style in front of the mountain villa show the dale scenes in the mountain area; the watercourse already existing is to be transformed into the stream flowing down between the rock bed, and the dale to be newly dug to the west of the watercourse has the stream rushing down the rapid slope between the rocky mountains, in the middle of which the waterfall, about four feet high, is constructed; the upper stream above this fall is narrow and gentle. Below the fall there is a linn; the water falling down forms a torrent and joins the other stream above the dam. The joining portion of two streams forms a wide and gentle valley having the path on the stepping stones or sand banks and a low stone lantern illuminating the path. The dam is about a foot high, and on it the stepping stones make a path.

The lake and the islands:

The water flows down and forms the lake. The southern portion of the lake shows the water view in the tableland, following the mountain area; on the lake shore the rock bed crops out, and there is the projecting cape and also the inlet. In the lake, the reefs are scattered and carp and trout are found.

To the north of the northern lake there are islands, and two bridges in different styles making the connecting path between the east and west sides of the lake. The islands are of rock and have low pine trees and a stone lantern composing the main view of the garden.

The northern portion of the lake from the islands develops a marshy landscape in the plain, and on the shore rocks are seen cropping out, while there are areas covered with reeds and iris, the grassy banks almost running into the water, the sandy beach and reedy strand. The north side of the lake shore has a stone wall for the developed area of the village (the clubhouse to be built). The dale scenery presented at the mountain area in the southern portion of the garden, and the stretch of water views starting from the lake in the tableland which passes into the marsh-like lake of the plain ending at the village area, are composed of the synthesis of stone arrangements, plantations and other decorative facilities which is the framework of this Japanese garden and accomplishes the whole, together with the surrounding parts of interest.

(1) Site for tea house and Japanese Garden, looking northeast; March 1958.
PHOTO BY: WHITIE MARTEN

(2) Tea house and part of garden from same area; October 17, 1960.
PHOTO BY: J. A. WITT

(3) East side of pool soon after excavation started; December 31, 1959.
PHOTO BY: WHITIE MARTEN

(4) View north over same area; October 17, 1960.
PHOTO BY: J. A. WITT

(5) View north over stone bridge and pool; March 22, 1960. Tea house on left.
PHOTO BY: B. O. MULLIGAN

(6) Nearer view of stone bridge and new plantings; October 17, 1960.
PHOTO BY: J. A. WITT

(7) Construction of the two bridges; April 5, 1960.
PHOTO BY: WHITIE MARTEN

(8) The bridges and stone lantern from Kobe; October 17, 1960.
PHOTO BY: J. A. WITT

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The mountain area:

The area of steep slopes at the southern part of the garden is the mountain area where several mountains and hills rise and fall. Near the mountain pass where paths get together stands a tea stall named "Karakasatei." A wide road (carriage way) runs through the north portion of the mountains and is provided with a bridge over the stream. In the mountains, conifers such as firs, Japanese cypresses, cedars, and *Torreya nucifera* together with the native trees grow luxuriantly and form thick forests. Near the source of the western stream, a storied stone pagoda stands as the relic of a mountain seminary and is seen from far away. From here, the forest begins to mix evergreen broad-leaved trees and then deciduous miscellaneous trees and passes into the flat forest of the tableland. The undergrowth of the mountain area is gold-leaf plants and *Fatsia japonica,* etc., for the depths, and mixed azaleas and so on along the stream.

The plum and cherry grove:

To the northwest from the mountain villa and on the west side of the lake there is a flowering garden planted mainly with plum and cherry trees as the developed area. In the center of the garden a square-shaped summerhouse is built and affords a rest place. Trees are to be planted of horticultural varieties; the undergrowth of the grove consists of seven autumn flowers and other Japanese native shrubs and herbs forming a flower garden.

The coppice:

The coppice extends from the plum and cherry grove to the site of the clubhouse and consists of Japanese oaks, *Quercus serrata, Carpinus laxiflora,* wild cherry trees, Zelkova, etc., adding here and there high Japanese red pines and *Pinus Thunbergii;* the coppice ground is covered by the Japanese native wild grasses, ferns and mosses, etc.

The camellia and sasanqua grove:

On the east side of the lake, Japanese native evergreens such as camellias and sasanquas are planted among the deciduous trees already existing and here a mixed plantation is made together with azaleas and other shrubs. Inside the garden gate, at the main entrance, hollies and *Taonabo japonica* form an evergreen plantation along the road.

The tea garden of the mountain villa:

The garden of the mountain villa (tea house) is constructed as a simple and quiet court for the tea ceremony, accommodated with a waiting booth, a water basin, stone lanterns, stepping stones and plantations, surrounded by a hedge having two wickets made of branches and twigs. This garden is only to be entered when admitted for the use of the tea house.

Stone lanterns and illumination, etc.:

Stone lanterns set in various places in the garden are important accessories for the landscape, and illumination of the road is to be specially prepared. In due places in the garden, wooden benches and drinking water are to be placed for the use of visitors.

Below:

Visitors at the opening of the Japanese Garden; June 5, 1960.

FIG. 10 PHOTO BY: B. O. MULLIGAN

Fruiting of the Garry Oak

THEO H. SCHEFFER*

EVEN a casual observer of things afield in southwestern Washington has taken some note of scant production in acorns by scattered oaks of the region. This is particularly so of one who has known other oaks in other parts of our country. There must be some natural reason or reasons for this scant production of mature viable nuts in the Garry oak as noted in our years here. And it is to discover these reasons, if practicable, that we undertook recently a series of close field studies of this oak in its flowering and fruiting.

The Garry oak, Western white oak, occurs in one section of southwestern Washington, mostly on the gravelly terrain formed by outwash from glaciation. The tree takes root in princely isolation or, more frequently, in scattered stands over the prairies of the Nisqually plains. In this situation the trees grow slowly, requiring an average of about eleven years to add an inch to the diameter.

Having established a series of ten collecting stations in a circuit of about twenty miles on and about the Fort Lewis military reservation, we proceeded to make inspection and collection of material throughout the summer and fall, including October. Results of these inspections indicated only what was already known, that many of the developing acorns were "wormy"; that is, infected by the larvae of certain insects.** The species most frequently observed was the larva of *Curculio uniformis,* a weevil. The other was that of a small white moth, *Melissopus latiferreanus.* The latter on emerging leaves a hole in the acorn shell a bit larger than that made by the weevil. One species weaves a small silken shelter in which to pupate. The weevil drops to the ground to pupate. While this wormy infestation greatly reduced the development of viable acorns, it does not and cannot account for the discrepancy between bountiful flowering in early May and the failure in many cases to set fruit.

It seemed desirable, therefore, to explore more fully the gap between the first swelling of the oak's flower buds in spring and the time when the staminate catkins shed their pollen. This study, undertaken in the present year, 1960, involved collections of material in the field from time to time and examining in the laboratory the development of the flower buds as distinguished from the leaf buds. Such examination under a microscope revealed in the pistillate parts of the flower a tiny gall wasp, first appearing in the pupa or cocoon stage and a little later in the season as an adult, itself capable of being observed only by use of a microscope. The prevalence of such an insect infestation in the pistillate flower could well account for failure of the embryo to develop normally.

One early authority in botanical fields has made the statement that in some cases the catkins of the oak are sterile. Such a condition, however, is not indicated in writings of later botanists.

It may be noted here that a low, almost prostrate form of the Garry oak, locally called the vine oak, occurring in some of the islands in the Gulf of Georgia, is not known to produce any acorns. We may add further that these so called vine oaks are at the extreme northern limits of the species on our coast and are so dwarfed there that they may seldom, if ever, reproduce by fruiting. We may account for their presence on the several islands as a result of acorn transportation by birds, particularly the band-tailed pigeon, an acorn-feeding species which migrates up and down the Pacific Northwest coast in season. There are normal, erect oaks growing not too far away to have supplied the seed for the

---

*Collaborator, U. S. Dept. of Agriculture. Author of *Field Studies of the Garry Oak in Washington,* (Arb. Bulletin, Fall 1959)

**The microscopic work in this research study was done by Dr. E. P. Breakey, entomologist, Western Washington Experiment Station, Puyallup.

sprawling vine oak. The botanist, David Douglas, reports a band-tailed pigeon carrying Chinquapin nuts in its crop for a distance of not less than 200 miles. To support this theory, or rather fact, we have a small grove of Chinquapin trees *(Castanopsis chrysophylla)* growing on a tributary of the Hamma Hamma river, on the Olympic Peninsula in western Washington.

Evaluation of the gall wasp factor in limiting the production of acorns in the Garry oak is not as yet practicable. For research in the case is yet new, or at least not reported, and prevalence of the insect infestations in flower buds of the oak could well account for much of the shortage in acorn production.

In summing up, we may say that the odds are against fertile fruiting of this western white oak on the arid, inhospitable plains of the Nisqually outwash where the species is most prevalent in the State of Washington. A prevalence not of its first choice, perhaps, but because of its friendliness to the original prairies (fig. 11).

Below:

Developing foliage and acorn of the Garry Oak, showing sessile attachment of acorns to the twig.

FIG. 11 PHOTO BY: THEO H. SCHEFFER

Japanese Shrubs in the Arboretum
(of the Order Rosales)

(Continued from Page 126)

growing and has less sharply toothed leaves than *C. lagenaria* (Boke). The latter is a rounded shrub of 6 - 10 feet and may have larger, more fragrant fruit. Both of these may be seen in the Quince section, beside Lake Washington Boulevard at Miller St.

Kerria japonica (Yamabuki) is a deciduous, medium-sized shrub with solitary, terminal, yellow flowers on the previous year's wood. The double-flowered form grows near the clubhouse. During the winter months its bright green branches are conspicuous. *Rhodotypos scandens* will be an upright spreading shrub to 5 or 6 feet. It is similar to *Kerria* but has opposite leaves and 4- (not 5-) petalled, white flowers. Its shiny black fruit may be seen from October on through the winter.

The Rose and Crabapple sections are living on borrowed time, since no one knows just how much of that area will be destroyed by the interchanges between the second Lake Washington bridge and the northward extension of Empire Way. *Rosa acicularis* is a shrub with pink flowers and small, pear-shaped, red fruits. *R. davurica* grows a bit taller, has rose-red flowers and oval, red fruits. Incidentally, this Japanese rose came to us via Copenhagen and was planted out in 1955. *R. Roxburghii (R. microphylla)* is growing nearby. It has peeling "paper bark" and its pink flowers are followed by spine-covered fruits. *R. multiflora* (Yashobi) is with us in great variety and grows very tall when it has any support. In Japan it is found along the sandy, gravelly riverbeds. *R. rugosa* (Hama-nasu) is well-suited for holding a sandy or gravelly bank. Wilson says this rose

does well near lakes or on the seacoast—"they laugh at salt spray." This extremely hardy rose has beautiful thick foliage that seems to be pest-free, it flowers from May until the first killing frost, and has fruits as large as crab apples. *R. Wichuraiana* (Torihanoibara) is another good bank-holder and, according to Wilson, is "essentially a maritime plant and will grow in brackish soil."

Two of the Arboretum's flowering cherries are shrubby in habit. *Prunus incisa,* just south and west of the picnic tables, is rather slow-growing and seldom reaches a height of more than 15 to 18 feet. Its flowers are white, with a red calyx, and its tiny oval fruits purplish-black. *P. tomentosa* has a more spreading habit, seldom reaching more than 8 feet. Its flowers are rose-tinged. Yoshimura mentions this species and others in this report as suitable for *Bonsai.*

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Some Arboreta and Gardens of N.W. Europe in 1960

(Continued from Page 124)

cultivation in N. America. Some fine heads of lilies were conspicuous in the walled garden beside the house, in the company of a large plant of *Magnolia Wilsonii.*

Mr. Cox was kind enough to take me to two other gardens in or near Perth, those of Major and Mrs. Knox-Finlay of Keillour Castle, and Mr. and Mrs. J. T. Renton of Branklyn. The former was especially notable for a large and most successful collection of *Primula* species, the latter for a wealth of good rock garden plants and smaller shrubs, especially *Ericaceae;* lilies were also much in evidence here, especially an old clump of the scarlet Grecian *Lilium chalcedonicum,* four feet in height or thereabouts.

(To Be Continued)

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Mr. Kelly Nishitani of the Arboretum Bonsai Unit will be available for consultation on Bonsai trees by appointment at the Arboretum. A charge will be made at $3.00 for pruning and shaping and $5.00 for repotting, pruning and shaping. Funds will go to the Nishitani Bonsai Unit for their project of a permanent display in the Arboretum. Call the Arboretum Foundation (EA 5-4510) for dates.

BOOK REVIEWS

The Iris, by N. Leslie Cave, revised edition. Four color plates, 35 monochrome illustrations 10 pages of line drawings and 3 maps. (St. Martin's Press, New York, 1959) Price $7.50

IN this second edition Mr. Cave has amplified his original book to bring the iris picture up to date. Constant improvement by breeders makes "best variety" lists soon obsolescent, and the past decade has seen a major development in the field, namely the vigorous renewal of interest in and active hybridization among the smaller bearded iris.

Mr. Cave's treatment of the diverse types of iris is excellent. Writing of iris as they are grown in England, he has not allowed the cultivated tall bearded types to obscure the other fascinating members of the genus. The book is, therefore, particularly strong in the so-called "species iris" sections, and Northwesterners will be pleased at his appreciation of our Pacific Coast natives. Excellent photographs provide ample proof of the wide variety of flower form and growth habit available to the gardener who grows iris.

The second half of the book is devoted to hybridizing, as it applies to tall bearded iris. Written chiefly for the beginning "iris faddist," it will also give the average gardener a good idea of what is involved in the production of new varieties of plants. The rules of inheritance are explained for the novice; mechanics of making crosses and methods of raising seedlings are discussed. The author reviews his original breeding predictions, noting which color advances have been attained in the interval and which have not. An entirely new chapter is devoted to the smaller bearded iris, the renewed popularity of which was scarcely anticipated ten years ago. Accomplishments of noted breeders, diseases and pests, color combinations, and the showing of iris complete the book. Five appendices, including distribution maps, add greatly to its usefulness.

Mr. Cave writes with a pleasing style, and one feels that he is passing on his personal experiences in growing iris, not merely the warmed-over words of others. I believe that the beginning iris grower and the average gardener will find this book much better suited to their needs than the American Iris Society's new book *Garden Irises*.

JEAN WITT

The Camellia, Vol. II, edited by Beryl Leslie Urquhart. The Leslie Urquhart Press, Sharpthorne, Sussex, England; (1960). Price £5-5-0

LESS than superlatives would fail to describe this handsome volume. Beautiful camellia paintings, two by Raymond Booth, fourteen by Paul Jones, have been superbly reproduced by K. G. Lohse of Frankfurt-am-Main, Germany. Six of the paintings portray *Camellia reticulata* varieties, one the hybrid "Donation," and nine new and old cultivars of *C. japonica*. Each painting has the name of the camellia in English and in Chinese characters. The text is brief. Foreword and Introduction by Beryl Leslie Urquhart deal interestingly with historical highlights of camellias in general and *C. reticulata* in particular. Each plate is accompanied by a page of text giving the name and synonyms of the camellia shown with a description and historical background. Additional comments by the hybridizer or introducer are included with some.

One can find but one fault with this delightful book—the very large size which makes it both awkward to handle and to fit into a library. However, one can hardly see how size could be reduced without sacrificing the beauty of the reproductions. It therefore becomes more of a collector's item than a book for the casual camellia enthusiast.

HELEN G. BUZARD

Note: This beautiful book was a gift to the Arboretum library by the Else Frye Unit No. 8.

Contemporary Perennials by Roderick W. Cummings and Robert E. Lee. Drawings by Allianora Rosse (The Macmillan Co., New York, 1960) Price $6.95

THIS small book contains a wealth of up-to-date information for all who grow perennials. Essentially a manual to be used in garden planning, the bulk of its very readable material is devoted to alphabetical descriptions of some 140 genera and more than 500 species of desirable perennials. Over 100 of the genera are illustrated with excellent black and white drawings showing flowers and foliage in detail and a habit sketch of the entire plant.

Each genus of plants is discussed under one or several headings: Garden Value, Soil and Exposure, Care, Propagation. A short paragraph is devoted to the best or most commonly cultivated species of the genus, sometimes with a word of caution about weedy ones. Superior varieties are recommended, and in the case of such highly developed plants such as chrysanthemum, the discussion of types and cultivars covers several pages.

One of the authors' aims is "to encourage the use of the latest and most authentic nomenclature of perennials," and many instances of changes or corrections in plant names are pointed out. They also make numerous suggestions as to genera and species worthy of improvement, for the gardener who would like to try his hand at hybridization or selection of new varieties. The reader is referred to the various special plant societies for additional information on such things as iris and primroses, where large numbers of species are of interest chiefly to fanciers.

The first 50 pages of the book deal with Planning, Planting, and Care of the Garden. Included are The Role of Perennials in the Garden, Planning the Flower Garden (with three actual plans for various types of borders), preparation, planting and maintenance, propagation, and insects and diseases. A list of the plant families covered, common and botanical names of all the plants discussed, and a glossary are given in the back of the book, together with a checklist of outstanding species. This last is an eight-page chart giving for each species such facts as height, color, cultural requirements,

(Continued on Page 144)

ARBORETUM NOTEBOOK

This section is particularly designed for notes, information and queries concerning beautiful or unusual plants from growers of all types or experience. We solicit your remarks and ideas, but space limitations may sometimes restrict us to publishing those of the widest interest.

CERCIS

AFTER seeing the Redbud in full bloom growing wild in Indiana and Michigan it was a great pleasure to find a fine specimen in West Seattle. The gay, brilliant magenta, pea-shaped blossoms were delightful in the sunlight. The flowers grow in tight bunches along the bare trunk and branches of the tree before the leaves come, about the same time our dogwood blossoms.

The leaves, too, are unusual, heart-shaped with a pointed tip. They do not develop until the flowers have faded. The American species, *Cercis canadensis,* is the one generally planted.

Cercis Siliquastrum is a species seldom used. It has paler blossoms, and may not be as hardy as other kinds. *C. Siliquastrum* is often called the Judas tree. There is a legend that Judas hanged himself on it. It is a tree that may be selected to enhance any border or background with assurance.

G. T. D.

HEPATICA

FOR shaded gardens the Hepaticas are perhaps the best loved of all wild flowers. They have been cultivated for centuries in almost every country. They have, for long years, been grouped with the *Ranunculaceae* family and sometimes have been classified with the Anemones. *Hepatica triloba* was then called *Anemone hepatica.*

They are found growing wild in large parts of eastern America, Europe, and Asia, with the exception of England. They are not obliging plants. They love a mountain copse in the shade of trees or shrubs and often refuse to grow in cultivated gardens where soil and protection are not to their liking. They love a rich, well-drained, woodland soil with their crowns never below the surface.

In an open winter blossoms may be found in late January, multiplying in numbers until late March and April when the plant is covered with a mass of sky-blue flowers in a nest of deeply cut leaves which are covered with silky hairs. When the plant has finished blossoming and the leaves are maturing they have a reddish tinge.

Eleanor Sinclair Rohde said, "There is something Victorian about their demure beauty," which I think is descriptive of their quaint manner of growth.

Hepatica triloba, or *Anemone hepatica,* is most commonly grown but there are several varieties with lavender, white, or pink blossoms. I have never seen the variety with double white blossoms but I have heard they are very beautiful. Hepaticas object to disturbance of any kind but they are not difficult to propagate from seed.

Some of Our Favorites☆

CHIMONANTHUS PRAECOX

CHIMONANTHUS PRAECOX *(fragrans)* sometimes known as Winter Sweet, has a variety *luteus.* It is a small shrub to possibly eight feet, deciduous and rather ordinary appearing. The leaves are a shiny clear green that turn yellow in the fall and then one seems to forget about the plant until on a sunny day in winter, sometimes in December and surely in January one is assailed by a wonderfully strong spicy scent. On the bare twigs of this small shrub are little bell-like flowers about an inch in diameter. They are waxy in appearance and of a lovely clear lemon-yellow color and so exquisitely fragrant one cannot forget this precious bloom. It would be well to plant this little shrub near

to the house so its small bloom and wonderful fragrance can be enjoyed in the winter. A south wall or the south side of an evergreen to augment the winter sun and provide a bit of protection against the winter winds should assure an early and happy blooming.

Mrs. Rex Palmer

HEPATICA TRILOBA

ONE sunny morning in March, while investigating a nearby nursery in search of something new, I discovered in an overgrown area, a clump of the brightest blue flowers imaginable, one and one-quarter inch in diameter, nodding on three-inch stems. As they moved gently in the spring breeze, they seemed to say, "It's wonderful to be alive." Convinced then and there, I purchased the plant from the nurseryman who was as unaware as I as to its nomenclature, for he had acquired the plant along with the land.

This lovely perennial and its numerous offspring, which I have assiduously cultivated, greet me each March on the first sunny mornings. It is *Hepatica triloba* var. *caerulea*. Liking a semi-shaded area and remaining undisturbed in fairly rich well-drained soil, it seeds itself generously. It also may be propagated by division of roots in the fall. The intriguing three-lobed leaves appear after the flowers and clothe the ground all year. Planted in front of *Helleborus corsicus* with its chartreuse blossoms, *Hepatica triloba,* a native of Europe, is a perfect complement, and still conveys the same message to me each March.

Mrs. J. W. Trosper

☆Won't You Send Us Yours?

Strictly Personal

(Continued from Page 130)

seen a spate of time. The reason I am so interested is that he gardens very much as I do—from the windows always. I should like to quote a bit, "But it does often occur to me how much more enjoyable the view from the windows might be if we concentrated our attention on *plants* rather than *flowers.*" I have never known any one else who realizes the handsomeness of the foliage of Iris foetidissima—they are on the broad side and have a beautiful metallic sheen. I am using it in a conspicuous place at the far and narrow end of the new driveway bed. Next to it I am planting *Euonymus japonicus* 'Aureus.' The leaves are sizable, oval, the centers bright green and the wide margins yellow-gold. I shall spread it to make it wider than tall. Behind these and up over the wall is a clematis with pink pendant bells.

Mr. Thomas can draw and is adept in the use of water colors. For an artist, I imagine, to paint a flower is comparatively easy but to get the characteristic line of stems and the attachment of leaves is more difficult. He must have fun. I could wish he might walk through my garden, appreciating here and questioning there and maybe seeing something new. It would be very pleasant.

When I go to nurseries I can for a few moments concentrate on what I need and then I get carried away with the plants themselves. It is sometimes weeks before I can find the exact place for them. This is how *Euonymus japonicus* 'Aureus' fared. But I enjoy my own aberrations!

As I write winter is on the way out; spring is all but here. The witchhazel still retains its yellow bloom. *Helleborus niger; H. corsicus* and *H. orientalis* are in full glory. Crocus, aconite, cyclamen — pink and crimson are lovely; hepatica, blue and pink, are showing color. Pushing the ground is a bright red mass, the young shoots of *Paeonia Cambessedesii.* I like this very much for it makes good promises so long awaited.

Yes, adventure is where you find it!

"Grief and trouble: My small bamboos, *Pleioblastus pumilus* and *Sasa Veitchii*, that gave me so much pleasure last winter, became too bold and insistently invasive with no shred of courtesy or consideration in their progress. I had to pull them out, bit by bit of spear-like root. I shall certainly miss the fresh green of *Pleioblastus pumilus.* Next time I shall heed Mr. Grant's admonitions."

Else M. Frye

Book Reviews

(Continued from Page 141)

period of bloom, etc., and should prove a most useful tool in planning the perennial border. I found it especially helpful in choosing plants for bloom in the off-seasons.

Northwest gardeners may be surprised at the omission of some familiar plants; this is, however, merely because we are able to grow an unusually large selection of material, and not a fault in a book which is intended for the United States as a whole. Beginners will find the book invaluable to acquaint them with perennials and their uses. The long-time gardener will find it equally valuable, particularly if he is interested in doing a bit more than usual with perennials.

JEAN WITT

We Would Like To Draw Your Attention To —

MORRIS ARBORETUM BULLETIN, Vol. II, No. 3, (Philadelphia, Sept. 1960). Reprints a most informative talk given by the Director, Dr. John M. Fogg, Jr., on "The Nature and Functions of an Arboretum," pointing out how such institutions can aid different groups and individuals in various ways.

Dr. Li reviews the maples cultivated in the Philadelphia area and provides illustrations of several uncommon Asiatic species; the cover depicts a vigorous young tree of our native *Acer macrophyllum*.

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PLANTS AND GARDENS, Vol. 16, No. 3, (Nov. 1960). Published by the Brooklyn Botanic Garden, New York. Edited by Dr. Cynthia Westcott. Devoted entirely to the subject of biological control of plant pests, this is a fascinating review of what has been and is being accomplished to rid our plants of aphis, scale insects, mealy bugs, nematodes and other serious problems by means of parasitic insects, disease organisms and other methods. The illustrations, as usual in this well-prepared journal, are excellent and most useful.

AMERICAN HORTICULTURAL MAGAZINE, Vol. 39, No. 4 (Washington, D. C., Oct. 1960). This issue contains a major attraction to the dwarf conifer enthusiasts, in the form of a short article on the Gotelli Arboretum of dwarf and slow-growing conifers, at South Orange, N. J., written by the owner, lavishly illustrated with 22 first-class photographs, mainly of individual specimens. This is probably the most important private collection of its kind in the country, beautifully arranged and maintained, containing nearly 600 kinds in a garden of 1½ acres.

In the same journal is a note by Dr. Henry T. Skinner, Director of the National Arboretum, Washington, D. C., on the new Plant Hardiness Zone Map recently published by the Agricultural Research Service of the U. S. Department of Agriculture, as Misc. Pub. No. 814, price 15 cents. This divides the U. S. and Canada into ten primary and ten subsidiary zones, according to the average annual minimum temperatures; each zone is a different shade of color. Copies of the map are available in the Arboretum office.

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Two other more technical publications which have reached the Arboretum library recently:

1. The Genus Rhododendron in Malaysia, by Dr. H. Sleumer, of Leyden, Holland; reprinted from Reinwardtia, Vol. 5, pt. 2, (Kebun Raya, Indonesia, March 1960), being part XXIII of his Florae Malesianae Precursores.

This comprises first a key to the subgenera, sections and subsections represented, followed by keys to the species in the subdivisions. Latin descriptions are given of all new species published; 261 are included in this comprehensive study.

2. "Studies on the Physiology of Bamboo," by Koichiro Ueda; Bulletin of the Kyoto University Forests, No. 30, (Kyoto, July 1960).

A most detailed and useful work on the cultivation of bamboos in Japan, including propagation, growth, size and quality, flowering, management of groves and much else on this subject, with 57 photographs to illustrate it.

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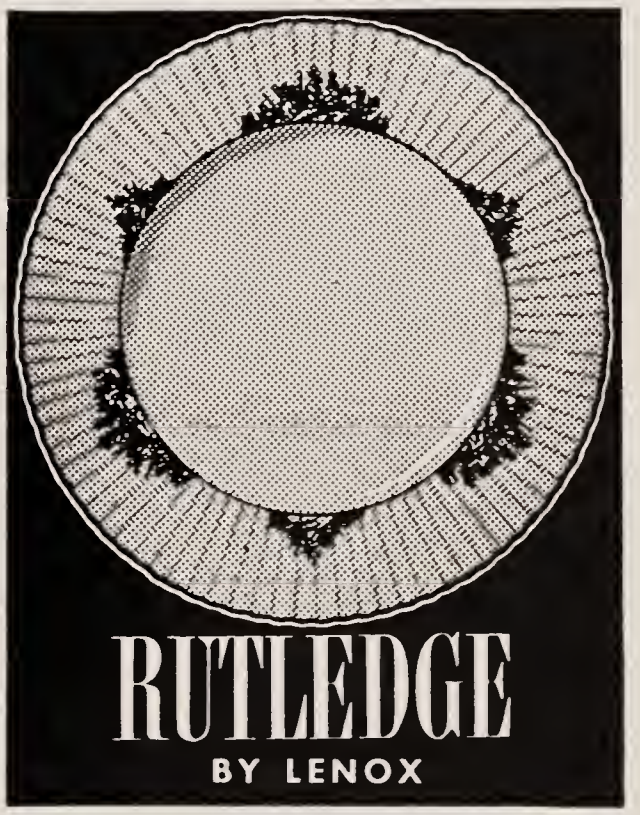

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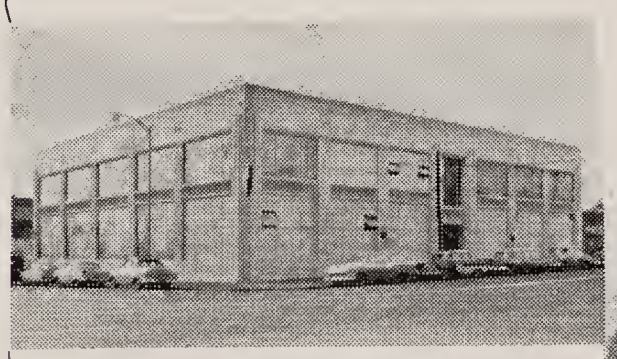

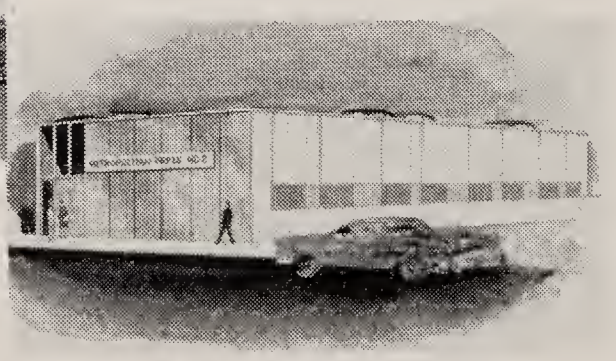

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